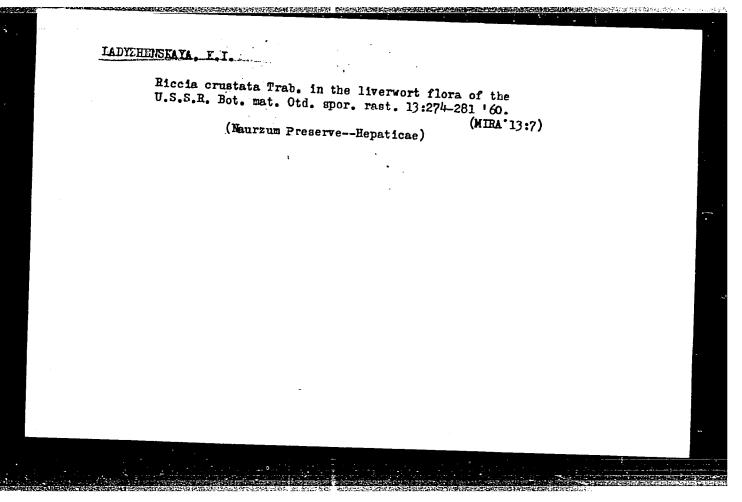


LADYZHENSKAYA. K.I. Riccia crustata Trav., a new liverwort species in the U.S.S.R.; according to Levitskii. Dokl. AN BSSR. 3 no.6:270-274 Je 159. (MIRA 12:10) 1. Predstavleno akademikom AN BSSR V.F. Kuprevichem.

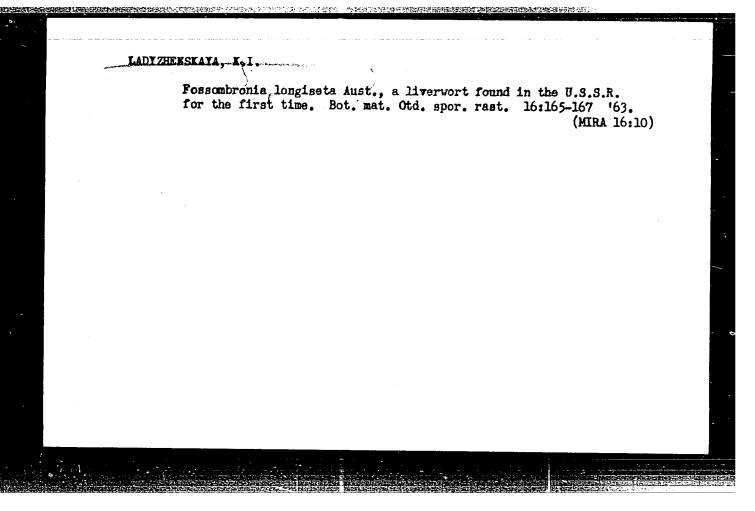
(Hepaticae)



LADYZHENSKAYA, K.I.

Investigation of the spores of Hepaticae. Bot. mat. 0+A. spor. rast. 14:243-252 Ja'61.

New species Riccia lamellosa Raddi and papillosa Moris in the U.S.S.R. Bot. mat. Otd. spor. rast. 14:252-262 Ja'61. (MIRA 17:2)



LADYZHENSKAYA, K.I.

Materials on the mosses of the U.S.S.R. Part 3. A new genus of liverworts (Lepicolea Dum.) in the U.S.S.R. Dokl. AN BSSR 7 no.4:270-273 Ap '63. (MIRA 16:11)

1. Botanicheskiy institut AN SSSR imeni Komarova, Leningrad. Predstavleno akademikom AN BSSR V.F. Kuprevichem.

LADYZHENSKAYA, K.I.

Materials on the bryoflora of the U.S.S.R. Pt. 4. A new genus of the liverwort Nechattoria Kamin. Dokl. AN BSSR 7 no.10:708-710 0 '63. (MIRA 16:11)

1. Botanicheskiy sad AN SSSR, Leningrad. Predstavleno akademikom AN BSSR V.F. Kuprevichem.

LADYZHENSKAYA, K. I.

"On evolution in Bryophyta on the basis of apospory."

report submitted for 10th Intl Botanical Cong, Edinburgh, 3-12 Aug 64.

AS USSR, Leningrad

OF NOT AN ARCHITECTURE PROCESSES AND AN ARCHITECTURE.

LADYZHENSKAYA, N.V. [Ladyzhens'ka, N.V.]

Resistance to brown rust in spring wheat leaves as related to their position on the stem. Trudy Inst. gen. i sel. AN UESR 5:63-72 '58. (MIRA 11:9)

(Wheat--Disease and pest resistance) (Uredineae)

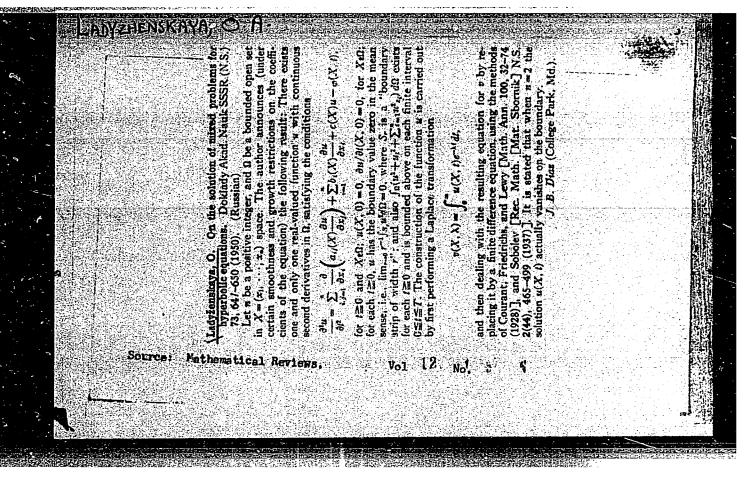
LADYZHENSKAYA, N.V.; GULIDOVA, L.A.; TIMOSHENKO, Z.F. (Dzerahinsk, Gortkovskoy obl.); ZEREKIDZE, R.I.

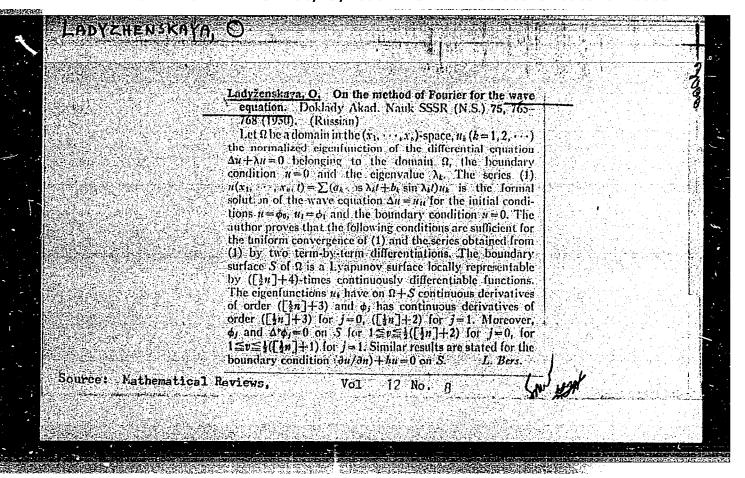
From the practices in the use of poisonous chemicals. Zashch. rast. ot vred. i bol. 9 no.3:24-25 '64. (MIRA 17:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh sredsty zashchity rasteniy (for Ladyzhenskaya, Gulidova).

2. Zaveduyushchiy otdelom zashchity rasteniy Gruzinskoy selektsionno-opytnoy stantsii Vsesoyuznogo'instituta kukuruzy, Mtskhetskiy rayon (for Zerekidze).

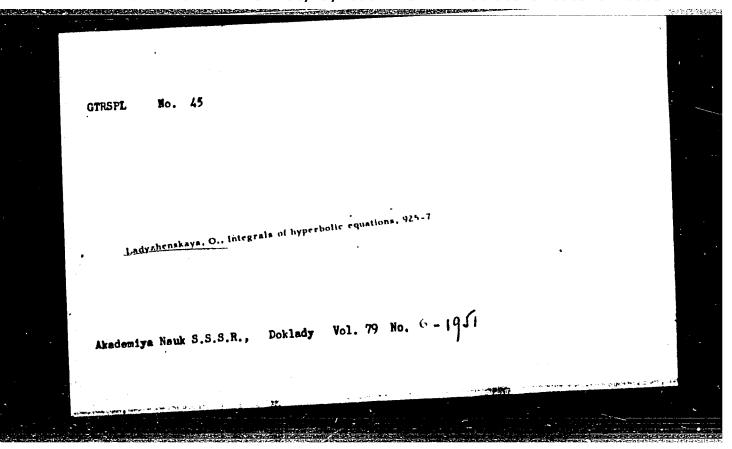
to (Ladyfamikyra, D. A. On the unquesses or the solution of Cannhy's problem for a thicar parabolic equation. Mat. Shornik N.S. 27(60), 175-184 (1930). (Russian) A. N. Tychonoff [Rec. Math. [Mat. Shornik.] (1) #2, 199	210 (1935) J has considered unbounded solutions of the K-auchy problem for the heat equation, and proved that: (1) at if the continuous solution U(s, t) of the heat equation 3U/st has continuous derivatives appearing in the equation on the infinite strip 0 < t < i, it grows so slowly that the last of the last it grows so slowly that the last last last last last last last last	and U vanishes it strp; (2) for any U(c, !) of the hos of (1); may that the	il [Bull. Univ. Ext., established that Cauchded politions of germoefficients depend on 12 Tychonoff's results contains an extension o	$\frac{\partial U}{\partial x} = \sum_{\substack{a_1, \dots, a_n \in \mathbb{N} \\ a_n = 1 \ a_n = 1}} dx_1 \dots dx_n$ $\text{(1) The corresponding growth conditions being}$ $\lim_{\substack{a_1, \dots, a_n \in \mathbb{N} \\ a_n = 1 \ a_n = 1}} U(x, t) \leq Ce^{n + \frac{n}{n} + \frac{n}{n}}$	where $r(x) = (\sum_{k=1}^n x^k y)^k$ and $x = (x_1, \dots, x_n)$; and also an extension of (2) to the parabolic equation $\frac{\partial U}{\partial x} = (-1)^{n-\frac{n-1}{2n+n}}.$	J. B. Dias (College Park, Md.).	
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LADYZHENSKA

·	GTRSPL No. 45	,
	Ladychenskaya, O., The completeness of the elliptical operator, 723-5	
	Ladyzbenskaya, O., The Compile City	
	Akademiya Nauk S.S.S.R., Doklady Vol. 79 No. 7, 19	
		53355-E



ladyzhenskaya, o.		235 T 70	
in a certain sense. Author reported case discussed here at a session of the Moscow Math Soc (see "Uspekhi Matemat Nauk" vol 6, No 1 (41), 1951). The results of this report for a wave eq were published by author in "Dok Ak Nauk SSSR" vol 75, No 6, 1950. Submitted by Acad V. I. Smirnov 22 May 52.	Investigates the nature of the convergence of the Fourier series $u(X, t)$ which formally satisfies all the requirements pased by the conditions (boundary, initial, etc.) $u/t_{t=0} = f(X)$, $u/t_{t=0} = F(X)$ on a hyperbolic eq; and in this way clarifies when the sum of the series gives the soln of the problem	nich Define the Hyperbolic ningrad State	

LADYZHENSKAYA, O.

PA 227T59

USSR/Mathematics - Mixed Problem, 1 Aug 52 Finite Differences

"Solving the Mixed Problem by Means of Finite Differences," O. Ladyzhenskaya

"Dok Ak Nauk SSSR" Vol 85, No 4, pp 705-708

Demonstrates several theorems governing the generalized soln of subject mixed problems by means of finite differences. Submitted by Acad V.I. Smirnov 22 May 52.

227159

LADYZHENSKAYA, O.A.

Solution of the Cauchy problem for hyperbolic systems by the method of finite differences. Uch.zap.Len.un. no.144:192-246
152. (MLRA 9:6)
(Differential equations, Partial) (Difference equations)

LADY ZHENSKAYA, O.A.

TREASURE ISLAND BIBLIOGRAPHICAL REPORT PHASE I

AID 314 - I

BOOK

Author: LADYZHENSKAYA, O. A. Full Title: COMPOSITE PROBLEM FOR A HYPERBOLIC EQUATION

Transliterated Title: Smeshannaya zadacha dlya giperbolicheskogo

uravneniya

Publishing Data

Originating Agency: None

State Publishing House of Technical and Publishing House:

Theoretical Literature

No. pp.: 279 Date: 1953

No. of copies: 4,000

Editorial Staff

Editor: None Editor-in-Chief: None

Tech. Ed.: None Appraiser: None

Call No.: QA342.L3

Academician Smirnov, V. I., Mikhlin, S. G.,

Smolitskiy, Kh. L., and Myshkis, A. D.

Text Data

Coverage:

The book mentions the two fundamental problems of linear hyperbolic equations with variable coefficients: The Cauchy problem, and the composite problem in the case of three or more variables. While the solution of the first has been analyzed by many authors, the second, which is

1/4

Smeshannaya zadacha dlya giperbolicheskogo uravneniya covered by this text, is an original attempt to pre a theoretical foundation for the different methods a theoretical foundation.	tention
The statements and wording are concise, and the attempts and wording are concise, and the attempts as mainly devoted to formulae, which in some cases is mainly devoted to formulae, which in some cases assumed to be understood a priori, as are the designant and symbols. TABLE OF CONTENTS Preface	are gnations PAGE 5 8 9 24-69
Introduction Ch. I Auxiliary Propositions Ch. I Auxiliary Propositions Standardized and Hilbert's spaces. Simplified Standardized and Hilbert's spaces of derivatives. Spaces Wr (\Omega) and theorems of derivatives. K. Friedrichs' classes of functions. enclosure. K. Friedrichs' classes of functions. Eigenfunctions. Some propositions on difference Eigenfunctions. Some propositions of a functions. Three lemmae of derivatives of a functions.	24-69 70-124
tion of a curved survey of the problem. Generalized solution Setting of the problem 2/4	

Smeshannaya zadacha diya giperbolicheskogo uravneniya AID	314 - I PAGE
Supplementary theorems. Fundamentals of Fourier method. Inhomogeneous equations. Integrals of hyperbolic equations.	125-189
Definition of the generalized uniqueness. Computation of the generalized uniqueness. Computation of the generalized uniqueness. Study of its differential properties. Solution. Study of its differential properties to solution.	
Reduction of indications of the homogeneous ones. Composite problem for the spaces and for common linear equations of the spaces and for common linear equations of the second order. Transformation of Laplace Transformation of the composite problem to the solution of Reduction of the composite equation. Generalized solution of of an elliptic equation. Survey of differential propirichlet's problem. Survey of differential properties of generalized solutions. Solution of the composite problem. On differentiation of eigenfunctions in a closed space.	190-220
3/4	

Smeshannaya zadacha dlya giperbolicheskogo uravneniya

AID 314 - I

PAGE

221-270

Ch. V Method of Analytical Approximation Evaluation of derivatives of the first and of higher orders of the solutions of an equation. Problems of Cauchy and Goursat (analytical cases). Transformation of an equation into characteristic coordinates. Composite problem and its solution (analytical and non-analytical cases). Solution of the composite problem for

spaces of the general form.

Appendix

Literature

271-276

Purpose: This book is apparently designed for persons with a deep 277

Facilities: None, with the exception of some names mentioned in

No. of Russian and Slavic References: 28 (1939-1953) of a total of 45.

4/4

LADYZHENSKAYA, O.A.

Mathematical Reviews
Vol. 14 No. 11
December, 1953
Numerical and Graphical
Methods.

Ladyženskaya, O. A. On application of the method of finite differences to the solution of Cauchy's problem for hyperbolic systems. Doklady Akad. Nauk SSSR (N.S.) 88, 607-610 (1953). (Russian)

This summarizes results obtained in the author's dissertation on numerical solution of systems

$$\frac{\partial u_i}{\partial l} = \sum_{j=1}^{N} \sum_{k=1}^{m} a^k_{ij}(l, x, u) \frac{\partial u_j}{\partial x_k} + b_i(l, x, u)$$

with initial conditions $u_i = \phi_i(x)$, where the arguments x and u denote x_1, \dots, x_m and u_1, \dots, u_N , and ϕ_i are periodic with period l in each x. If $\partial u_i/\partial t$ are approximated by $[u(t+\Delta t, x) - u(t, x)]/\Delta t$, and $\partial u/\partial x_k$ by

$$[u(t+\Delta t, \dots, x_k+\Delta x_k, \dots, x_m) - u(t+\Delta t, \dots, x_k, \dots, x_m) + u(t, \dots, x_k+\Delta x_k, \dots, x_m) - u(t+\Delta t, \dots, x_k, \dots, x_m)]/4\Delta x_k$$

with $\Delta x_k = l/n$, the corresponding system of difference equations is satisfied by trigonometric polynomials u_{ik} . The author asserts, without specifying hypotheses on $a^k u_i$, b_i , and ϕ_i , that as Δt and Δx tend to zero u_{ik} converge uniformly to the solutions of the partial differential equation when $\Delta t/\Delta x$ is less than some constant. Other approximations to $\partial u_i/\partial x_k$ by means of central, forward, or backward differences with respect to x_k at time t are said to lead in general to divergent processes.

J. H. Giese.

LADYZHENSKAYA. O. A.

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No. 22-40, 20 Feb - 3 Apr 1954)

Heme

Title of Work

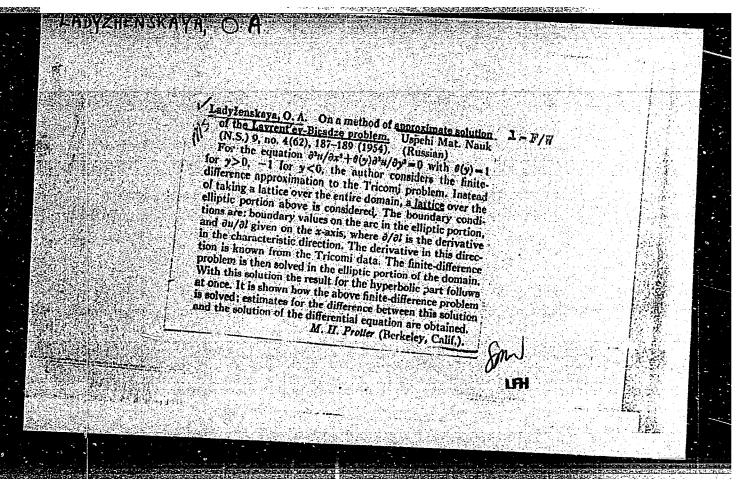
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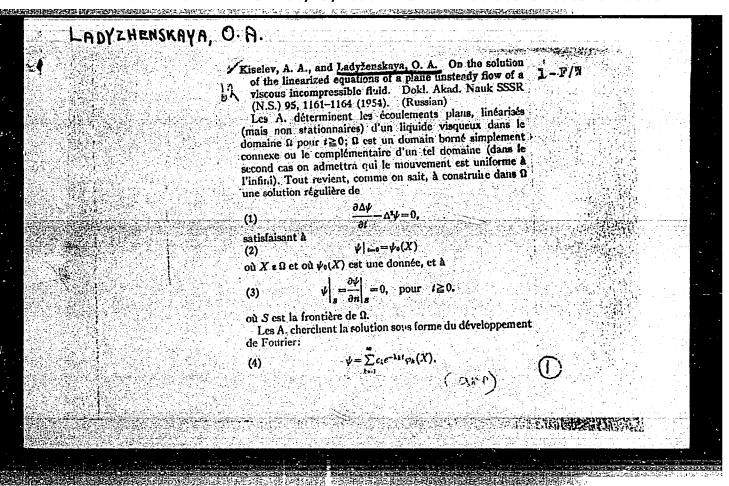
Ladyshenskaya, 0. A.

"The Mixed Problem for Hyperbolic Equations"

Ioningrad State University imeni A. A. Zhdanov

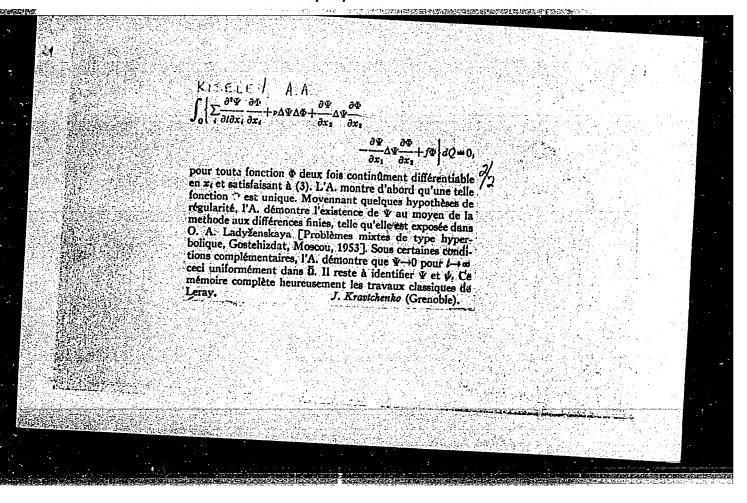
80: W-30604, 7 July 1954

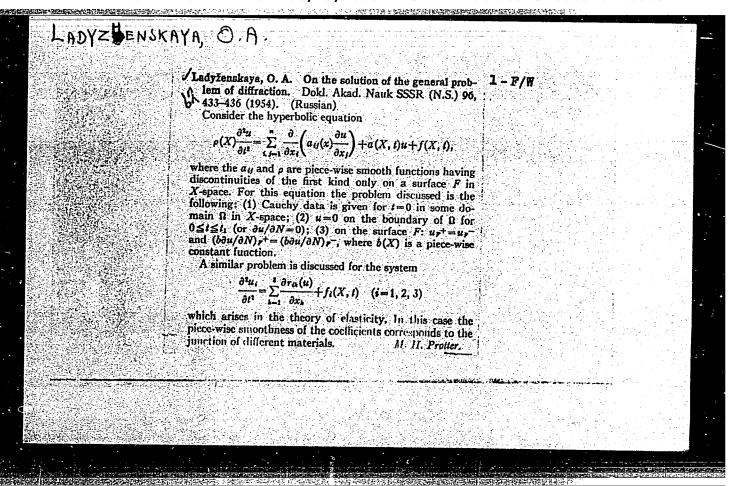




"APPROVED FOR RELEASE: 06/19/2000

CIA-RDP86-00513R000928420005-1





LADYZHENSKAYA, O. A.

USSR/ Mathematics - Boundary problems

Card

: 1/1

Authors

: Ladyzhenskaya, O. A.

Title

3 Solvability of fundamental boundary problems of parabolic and hyperbolic type equations.

Periodical

* Dokl. AN SSSR, 97, Ed. 3, 395 - 398, July, 1954

Abstract

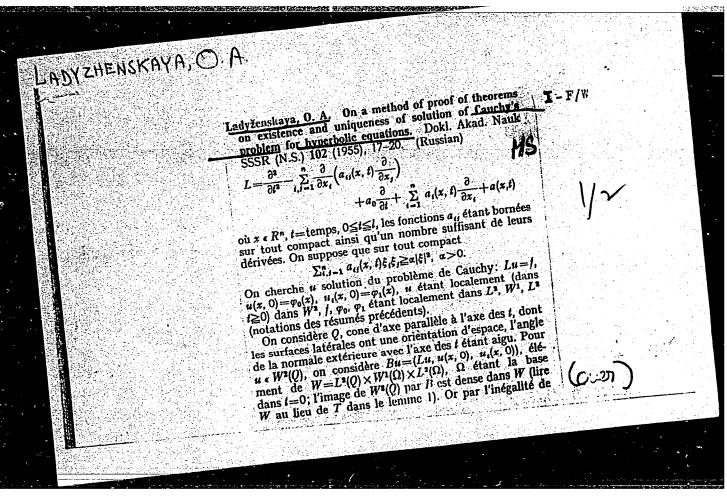
1 It was shown that the boundary problem for cases such as the heat-conductivity and wave equations can be solved by a simple method. Then, by using simple deductions, the solutions can be applied generally to parabolic and hyperbolic equations. Two references.

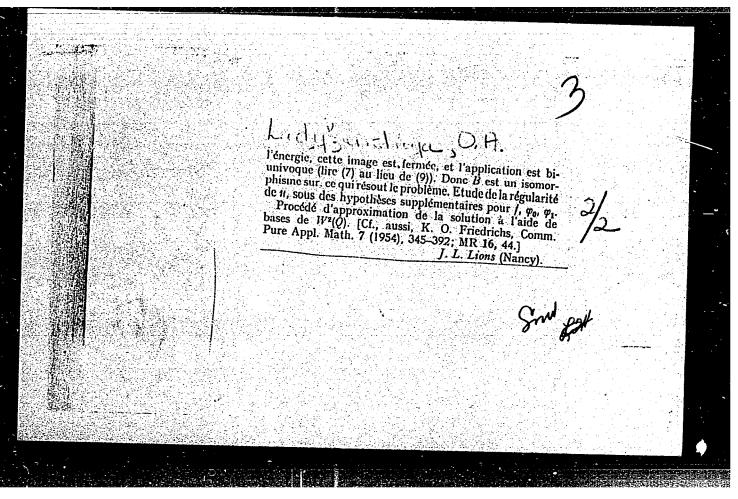
Institution : A. A. Zhdanov State University in Leningrad.

Presented by : S. L. Sobolev, Academician, April 28, 1954

LADYSHENSKAYA, O.A.

Simple proof of the solvability of basic boundary value problems and problems of eigenvalues for linear elliptic equations. West. Len.un. 10 no.11:23-29 N 155. (MLRA 9:3) (Eigenvalues) (Functions, Elliptic) (Differential equations)





LADYZHENSKAYA, O, A

USSR/Mathematics - Operational equations

Card 1/1

Pub. 22 - 4/59

Authors

Ladyzhenskaya, O. A.

Title

About the solution of nonstationary operator equations of various types

Periodical 1 Dok. AN SSSR 102/2, 207-210, May 11, 1955

Abstract

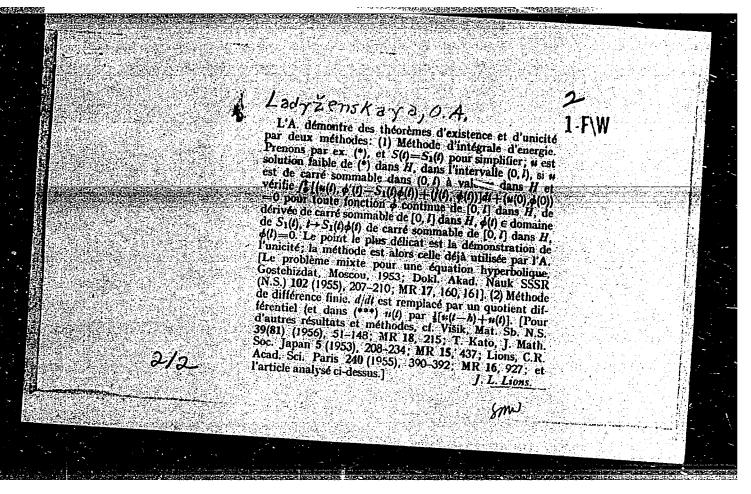
Solutions of certain types of operational equations are discussed in connection with the applicability of a new method to the solutions. This method was introduced by the author and discussed in an earlier article. Three USSR references (1953-1955).

Institution: Leningrad State University imeni A. A. Zhdanov

Presented by: Academician L. S. Sobolev, January 13, 1955

VISHI	K, M.I.; LADYZHENSKAYA, O.A.	
	Boundary problems for equations with partial derivatives and certain classes of operator equations. Usp.mat.nauk 11 no.6:41-97 H-D *56. (MIRA 10:3) (Differential equations, Partial) (Operators (Mathematics))	
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		

On the solution of non-stationary 1.	W	
operator equations. Mat. Sb. N.S. 39(81) (1956), 491-		
524 (Russian) On cherche u(I), fonction de I (temps) à valeurs dans un espace de Hilbert II, vérifiant dans un sens plus on moins généralisé une équation différentielle		
$\frac{du}{dt} + S(f)u = f, \ u(0) \text{ et } f \text{ donnés},$		
où S(t) est une famille d'opérateurs non bornés dans H, assujettis à diverses conditions de nature "elliptique", De même l'A. considère		
$\frac{d^2n}{dt^2} + S(t)n = f$, ≈ 100 , $n'(0)$, f donnés.		
et les opérateurs du type Schroedinger		
$\frac{du}{dt} + iS(t)u = f, u(0) \text{ donné},$		
$S(t)$ auto-adjoint (sans hypothèse d'ellipticité pour l'existence). Excepté dans $(***)$, $S(t)$ est de la forme $S_1(t) + S_2(t)$, où les $S_1(t)$ sont auto-adjoints à domaine in-dépendant de t (condition génante pour les applications) et les $S_2(t)$ "petits" devant $S_1(t)$.		



LADYZHENSKAYH, O.A.

USER/MATHEMATICS/Differential equations SUBJECT

CARD 1/3

AU THOR LADYŽENSKAJA O.A.

TITLE

First boundary value problem for quasilinear parabolic equations. PERIODICAL Doklady Akad. Nauk 107, 636-639 (1956)

reviewed 10/1956

The equation

(1)
$$Iu = \frac{\partial u}{\partial t} - \sum_{i,j=1}^{n} a_{ij}(x,t,u) \frac{\partial^{2}u}{\partial x_{i} \partial x_{j}} + \sum_{i=1}^{n} a_{i}(x,t,u) \frac{\partial u}{\partial x_{i}} + a(x,t,u) = 0$$

with the initial and boundary conditions

(2)
$$u \Big|_{t=0} = \varphi_0(x) , \qquad u \Big|_{s} = 0$$

is considered in the cylinder $Q_{T} = \Omega \times [0 \le t \le T]$. There T is arbitrary but fixed and Ω is a bounded domain which can be mapped biuniquely onto a sphere or a sphere ring, where the mapping functions $\mathbf{y_i}(\mathbf{x})$ in Ω possess bounded derivatives of second order and the functional determinant is different from zero. Let the function $arphi_0$ possess continuous first derivatives with respect to $\mathbf{x_k}$ which in Ω satisfy the Hölder condition with arbitrary exponent $\epsilon>0$; φ_0 be equal zero. For all u and $(x,t) \in \overline{\mathbb{Q}}_{\overline{T}}$ be

Doklady Akad Nauk 107, 636-639 (1956)

CARD 2/3

PG - 321

$$\frac{\partial \mathbf{a}(\mathbf{x},\mathbf{t},\mathbf{u})}{\partial \mathbf{u}} \geqslant \beta_1$$
 and $|\mathbf{a}(\mathbf{x},\mathbf{t},0)| < \beta e^{|\beta_1|\mathbf{t}-\frac{1}{2}}$

Let the coefficients a_{ij} , a_i , a and a_u be continuous functions of (x,t,u) and possess first derivatives with respect to x and u which have an upper bound C_2 and let them satisfy with respect to x and u the Hölder condition with the exponent $c_1 > 0$ and the constant c_3 , if $(x,t) \in \overline{Q}_T$ and

$$|u| \leq (\max |\varphi_0| + \beta T)e^{|\beta_1|T} \equiv C_1$$
.

Let the expressions

$$\left| \begin{array}{c} a_{ij}(x,t+h,u) - a_{ij}(x,t,u) \\ \hline h \end{array} \right|$$

be bounded by a constant, $\sum_{i,j=1}^{n} a_{ij} \xi_i \xi_j \ge \propto \sum_{i=1}^{n} \xi_i^2$, $\alpha = \text{const} > 0$ and

$$\max_{\mathbf{q}} \frac{\partial \mathbf{a}_{i,j}}{\partial \mathbf{u}} \leq \frac{\alpha e \sqrt{3}}{12u C_1}, \text{ if } (\mathbf{x}, \mathbf{t}) \in \overline{\mathbf{Q}}_{\mathbf{T}} \text{ and } |\mathbf{u}| \leq C_1.$$

To the function class \mathfrak{M} there belong all functions v of $L_2(Q_T)$ which for an arbitrary fixed $t \in [0,T]$ are continuous in $\overline{\Omega}$ with respect to x, which

Doklady Akad. Nauk 107, 636-639 (1956)

CARD 3/3

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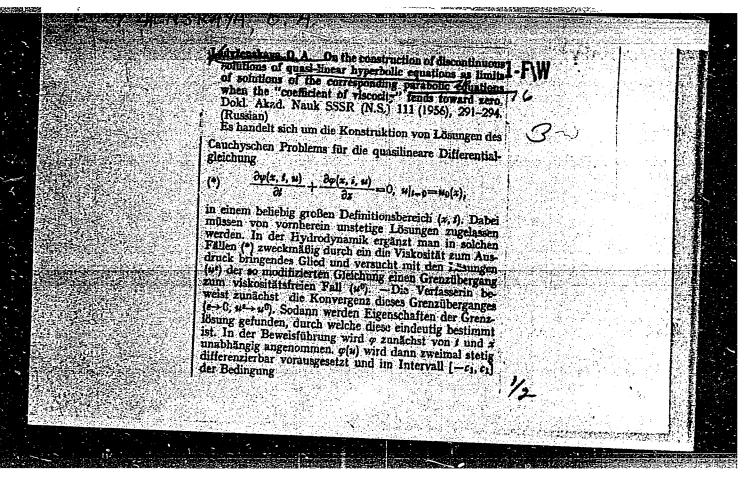
possess bounded (generalized) derivatives with respect to x_k , which possess (generalized) derivatives $\frac{\partial y}{\partial t}$ and $\frac{\partial^2 y}{\partial x_i \partial x_j}$ (these derivatives shall belong

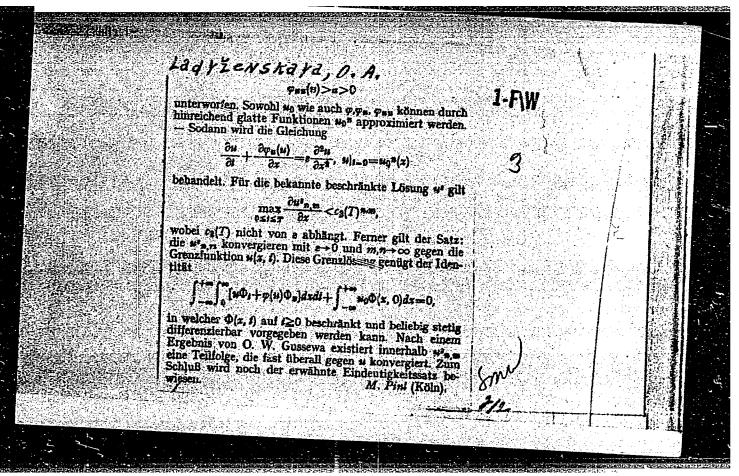
to $L_2(Q_T)$) and which vanish on the lateral surface of Q_T . Under the above assumptions and notations it is proved that the problem

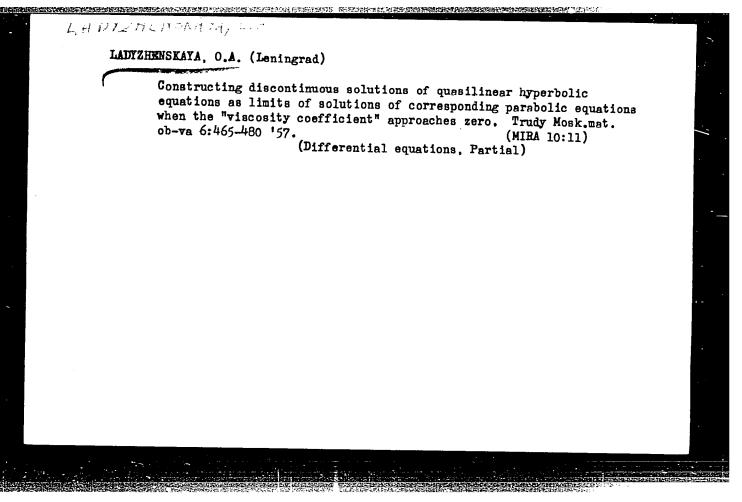
(1)-(2) possesses a single solution in the class \mathcal{M} . For the proof a scheme of Rothe (Math.Ann 102, 4-5 (1929)) and the theorem of Schauder (Math.Zeitschr. 38, (1934)) on the solvability of the first boundary value problem for elliptic equations are used. Besides the proof bases on some estimations of the absolute amounts of the solutions of the differential-difference equations which correspond to Rothe's scheme.

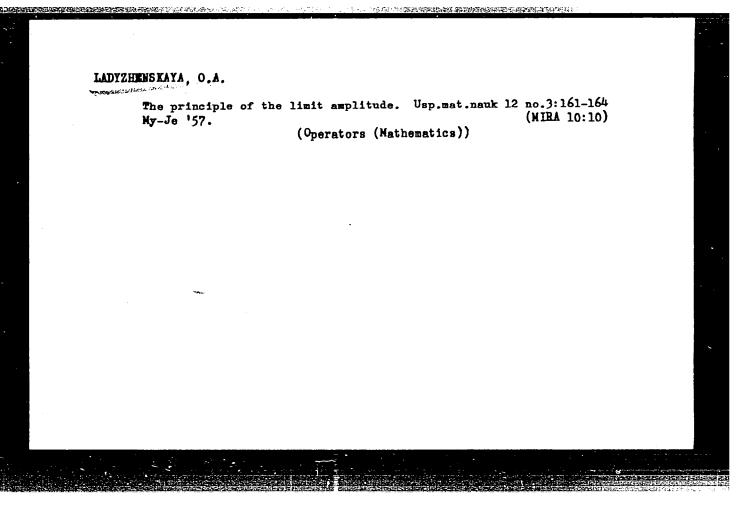
Then it is shown that if some further conditions are satisfied (existence of bounded derivatives up to the third order for the coefficients, satisfaction of the Lipschitz condition) then the obtained solution is continuous in $\overline{\mathbb{Q}}_{T}$ and possesses continuous derivatives inside of \mathbb{Q}_{T} .

INSTITUTION: Zdanov University, Leningrad.









THE PROPERTY OF THE PROPERTY O

LADYZ HENSKHYH

AUTHOR:

LADYZHENSKAYA O.A.

42-5-2/17

TITLE:

The Difference Method in the Theory of Partial Differential Equations (Metod konechnykh raznostey v teorii uravneniy s chastnymi proizvodnymi)

PERIODICAL: Uspekhi Mat.Nauk, 1957, Vol. 12, Nr.5, pp.123-148 (USSR)

ABSTRACT:

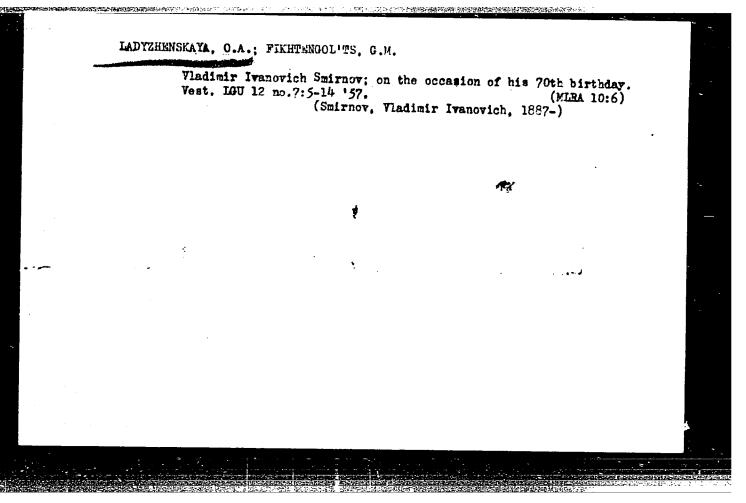
The present paper is an elaboration of the summary which the author has presented in 1956 at the Third Union Congress of Mathematicians in Moscow. The contents in essential is determined by the numerous investigations of the author. These chiefly are assertions of existence and the investigation of differential properties of the solutions. The proof of the existence of the solution of the Cauchy problem for equations of hyperbolic type is discussed in detail. The author treats the most modern methods, e.g.: the extension of Sobolev's imbedding theorems to functions defined on grids, generalized solutions, stability of the difference scheme, application of the difference methods to nonlinear problems etc. The bibliography consists of 27 essential Soviet publications, 8 of them are due to the author, and 12 foreign references.

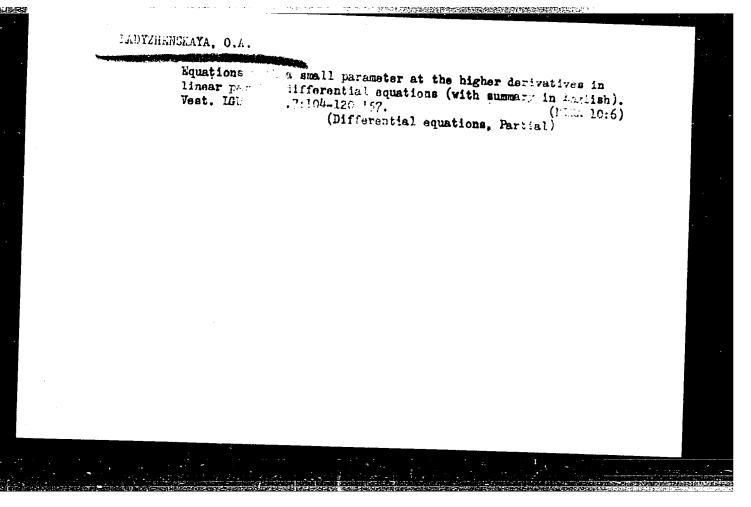
AVAILABLE: Library of Congress

Card 1/1

1. Partial differential equations-Theory

CIA-RDP86-00513R000928420005-1" APPROVED FOR RELEASE: 06/19/2000





LABY ZHENSKAYA, O. A. 38=5-4/6 KISELEV, A.A., LADYZHENSKAYA, O.A. On the Existence and Uniqueness of the Solution of the Nonsteady Problem for a Viscous Incompressible Fluid (0 sushchestvovanii i yedinstvennosti resheniya nestatsionarnoy zadachi AUTHOR: dlya vyazkoy neszhimayemoy zhidkosti). Izvestiya Akad.Nauk, Ser.Mat., 1957, Vol. 21, Nr 5, pp. 655-680, (USSR) TITLE: The present paper contains the proofs of the theorems of existence and uniqueness which were announced last year by Kiselev PERIODICAL: (Doklady Akad. Nauk 106, 27-30, 1956) for the systems ABSTRACT: $\frac{\partial \vec{v}}{\partial t} - \nu \Delta \vec{v} + \sum_{k=1}^{3} v_k \frac{\partial \vec{v}}{\partial x_k} = - \operatorname{grad} p + \vec{f}(x,t)$ $\overrightarrow{div}\overrightarrow{v}=0$, $\overrightarrow{v}|_{8}=0$, $\overrightarrow{v}|_{t=0}=\overrightarrow{a}$ $\frac{\partial \vec{v}}{t} - \nu \Delta \vec{v} + \sum_{k=1}^{3} v_k \frac{\partial \vec{v}}{\partial x_k} = \vec{f}(x,t)$ \overrightarrow{V} | $\overrightarrow{s} = 0$, \overrightarrow{V} | $\overrightarrow{t} = 0$ Furthermore estimations of the solutions are proved according CARD 1/2

On the Existence and Uniqueness of the Solution of the Nonsteady 38-5-4/6 Problem for a Viscous Incompressible Fluid

to Ladyzhenskaya and the differential properties of the solutions are investigated. The most essential result is the answering of the question in which functional classes (1)

possesses a unique solution. PRESENTED: By V.T. Smirnov, Academician

SUBMITTED:

March 16, 1957 Library of Congress AVAILABLE:

CARD 2/2

LADYZHENSKAYA, O. A. and FADDEYEV, L. D.

"Perturbation Theory of a Continuous Spectrum."

paper submitted at International Congress Mathematicians, Edinburgh, 14 - 21 Aug

LADYZHENSKAYA, O.A.

PRASE I BOOK EXPLOITATION 1087

Moskovskoye matematicheskoye obshchestvo

Trudy, t. 7 (Transactions of the Moscow Mathematical Society, v. 7)
Moscow, Fizmatgiz, 1958. 438 p. 1,500 copies printed.

Editorial Staff: Aleksandrov, P.S.; Gel'fand, I.M. and Golovin, O.N.; Ed.: Lapko, A.F.; Tech. Ed.: Yermakova, Ye.A.

PURPOSE: This book presents original articles submitted to the Moscow Mathematical Society and is intended for specialists in various fields of mathematics.

COVERAGE: Volume 7 contains 12 articles concerning problems in different fields of mathematics, including functional analysis, differential geometry and mathematical logic. All contributions in this volume are Soviet. Most of the articles deal with problems of functional analysis which reflect the present-day status and trend of this branch of mathematics.

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The basic results given in this article were presented at the November 9, 1959 session of the Mascow Mathematical Society. The article contains the following sections:

Introduction:

1.) Certain results concerning hyperbolic equations; 2) Proof of the Uniqueness Theorem; 3) Shedwhert of an inverse wroblem connected with the scattering of waves; Referencess

Krasmoseliskiy, M.A. and Rativskiy, Ya.B. (Voronezh)

Orlich Spaces and Nowlinear Integral Equations
The basic results given in this article were presented at the March 2, 1954
session of the Moscow Mathematical Society. The article contains the following sections: Introduction; 1) Basic definitions; 2) Splitting of linear

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1087 Transactions of the Moscow Mathematical (Cont.) integral operators; 3) Operator f; 4) Hammerstein operator; 5) OperatorG; 6) Differentiability of the Hammerstein operator; 7) Applications to theorems of the existence of solutions and to eigenfunctions; References. Kornblyum, B.I. (Kiyev). Generalization of Wiener's Tauberian Theorem and 121 Harmonic Analysis of Fast Increasing Functions The basic results given in this article were presented at the April 23, 1954 session of the Moscow Mathematical Society. The article contains the following sections: 1) Introduction; 2) Theorem of Wiener type; 3) Lemmas on spaces L($-\infty,\infty;q$) and M($-\infty,\infty;d$); 4) lemmas on Fourier transformations; 5) nemmas on functions analytic in a strip; 6) Proof of theorem I; 7) Ideals and I; 8) General Tauberian Theorems; 9) Theorem of Berling type;
Spectrum: of fast increasing functions: Because 10) Spectrum of fast increasing functions; References. Ledyzhenskaya, O.A. (Leningrad). Solution of the First Boundary Value 149 Problem on the large for Quasilinear Parabolic Equations The basic results given in this article were presented at the December 18, 1956 session of the Moscow Mathematical Society. The article contains the following sections: Introduction; Ch. I. A Priori Evaluations for the

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Solutions of Problems (1) and (2); 1) Evaluation of the modulus of a solution; 2) Evaluation of first derivatives of u(x,t) with respect to xk in a closed region \mathfrak{R} ; 3) Evaluation in the form of integrals of u derivatives contained in the equation; 4) Evaluation of the second order derivatives of u with respect to x in the interior of a region St; 5) Evaluation of the third order derivatives of u with respect to x; 6) Evaluation of derivatives D_{tx}^2 u, D_{tx}^4 u and D_{tx}^2 2 u;

Ch. II. Theorems on Existence and Uniqueness of a Generalized Solution of the Boundary Value Problem; 1) Construction of Approximate Solutions; 2) Evaluation of | grad u (x,tp)|; 3) Evaluation of D2 u and u in the form of integrals; 4) Proof of the existence and uniqueness theorem of a generalized solution; Ch. III. Investigation of Differential Properties of a Generalized Solution. The Existence of a Classical Solution; References.

Ryzhkov, V.V. Conjugate Systems on Multidimensional Spaces The basic results given in this article were presented at the March 20, 1956 session of the Moscow Mathematical Society. This article contains

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the following sections: Introduction; Ch.I. Conjugate Systems; 1) Designations and basic definitions; 2) Differential equation defining conjugate systems; 3) Condition for complete stratification of a conjugate system; Ch. II. Completely Stratifiable Conjugate Systems; 4) n - conjugate systems; 5) Conjugate Systems with one multidimensional component; 6) Completely stratifiable conjugate systems with several multidimensional components; 7) General remarks on complete stratifiable conjugate systems; References.

Fage, M.K. (Chernovitsy). Operationally Analytic Functions of Ome Independent Variable [Functions Defined by an Ordinary Linear Differential Operator 227 L of an Arbitrary Order With Continuous Coefficients] The basic results given in this article were presented at the October 30, 1956 session of the Moscow Mathematical Society. The article contains the following sections: Introduction; 1) L-bases; 2) L-analytic polynomials; 3) Taylor's L-formula; 4) Taylor's L-series; 5) L-holomorphic functions; 6) L-analytic functions. Uniqueness theorem; 7) Regularly convergent sequences of L-analytic functions; 8) Operator with analytic coefficients; 9) Local equivalency of operators of an equal order; 10) Cauchy problem in the region of double operationally holomorphic functions; References.

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Levitan, B.M. Differentiation of Eigenfunction Expansion of the Schrödinger The basic results given in this article were presented at the October 4, 1955 session of the Moscow Mathematical Society. The article contains the Equation following sections: Introduction; 1) Solution of Cauchy problem; 2) Evaluation for arbitrary sigenfunctions; 3) Evaluation of derivatives of eigenfunctions in the case of an infinite region; 4) Differentiation of eigenfunction expansion; 5) The case of $q(x) \rightarrow +\infty$ at $|x| \rightarrow \infty$; References. 291

Men'shov, D.Ye. Limit Functions of a Trigonometric Series The basic results given in this article were presented at the April 16, 1957 session of the Moscow Mathematical Society. The article contains the following sections: 1) Introduction. [Basic definitions and formulation of three theorems]; 2) [Preliminary remarks, definitions and auxiliary theorems needed to prove theorem II. Proof of theorem II[; 3) [Definitions and lemmas needed to prove theorem III]; 4) [Proof of Theorem III;] 5) Derivation of theorem I from theorems II and III; References.

Grayev, M.I. Unitary Representations of Real Simple Lie Groups This article was presented at the January 20, 1956 Session of the All-Union Conference on Functional Analysis and its Applications. The article contains the following sections: Introduction; 1) Gpq group; parameters and an invariant measure of Gp9

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2) Generalized linear elements and transitive manifolds; 3) Discrete series of representations of type 1; 4) Irreducibility of representations of a discrete series; 5) Traces of representations of a discrete series;

6) Indiscrete basic series of unitary representations of Gp, q group;

References.

Muchnik, A.A. Solution of Post's Reducibility Problem and of Certain Other Problems of the Magory of Algorithms. I. Pasic results of the article were presented at the October 16, 1956 session of the Moscow Mathematical Society. The article contains the following sections: Introduction; Ch. I. Functional Representation of Partially Recursive Operators; 1) Cortege and quasi-cortege; 2) Functional representations of operators; 3) Universal partially recursive operator; 4) Calculation [solution] of M - [Medevedev] problems; Ch.II. Decision Problems of Enumerable Sets; I) Semilattices U(p); 2) Post's reducibility Enumerable Sets; 1) Semilattices problem; References.

Muchnik, A.A. Isomorphism of Systems of Recursively Enumerable Sets With Effective Properties

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The basic results given in this article were presented at the December 17, 1957 session of the Moscow Mathematical Society. The article contains the following sections: 1) Introduction; 2) On the correspondence (reducibility) of systems of sets; 3) Effective inseparability; 4) Quasi-effective properties; References.

Raykov, D.A. Completely Continuous Spectra of Convex Spaces

Basic results given in this article were presented at the December 3,
1957 session of the Moscow Mathematical Society. The article contains
the following sections Introduction; 1) Preliminary information and
agreements of a general character; 2) Preliminary information on projective limits; 3) Preliminary information on inductive limits; 4) Spaces of
type (S); 5) Spaces of type (S); 6) Spaces of type (S'); 7)
Preliminary information from the theory of duality; 8) Conjugate mappings;
9) Duality of classes (S) and (S'); 10) Nondegenerated spectra; References.

AVAILABLE: Library of Congress

Card 8/8

LK/fal 2-24-59

AUTHOR: LADYZHENSKAYA, O.A. 43-7-8/18

TITLE: On Integral Estimates Convergence of Approximate Methods and

the Functional Solutions of Linear Elliptic Operators (Ob integral'nykh otsenkakh, skhodimosti priblizhennykh metodov i resheniy v funktsionalakh dlya lineynykh ellipticheskikh

operatorov)

PERIODICAL: Vestnik Leningradskogo Universiteta, Seriya Matematiki, Mekhaniki

i Astronomii, 1958, Nr 7 (2), pp 60-69 (USSR)

ABSTRACT: The present paper contains some partially little connected

corollaries and possible generalizations of the well-known publications of the author [Ref.1-4]. The greatest part of these completions is already contained in the modern Russian

papers published meanwhile.

10 Soviet and 1 foreign references are quoted.

SUBMITTED: 25 November 1957 AVAILABLE: Library of Congress

Card 1/1 1. Integrals 2. Functions-Theory

Solving the first boundary problem on the whole for quasi-linear parabolic equations. Trudy Hosk.mat. ob-va 7:149-177 '58.

(Bifferential equations, Partial)

(Differential equations, Partial)

AUTHORS:

Bakel'man, I.Ya, Birman, M.Sh., and Ladyzhenskaya, O.A.

SOV/42-13-5-11/15

TITLE:

Solomon Grigor'yevich Mikhlin (on the Occasion of his 50th

Birthday) (Solomon Grigor'yevich Mikhlin (K pyatidesyatiletiyu

so dnya rozhdeniya))

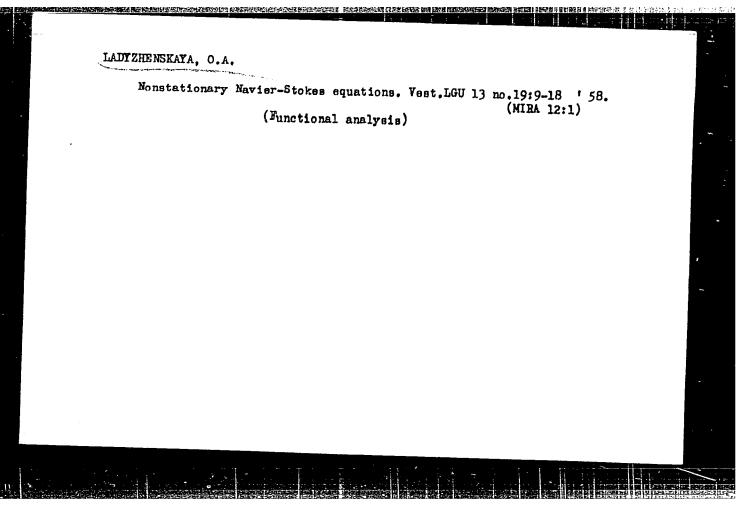
PERIODICAL: Uspekhi matematicheskikh nauk, 1958, Vol 13, Nr 5,pp 215-222 (USSR)

ABSTRACT:

This is a short biography and a summary of the scientific activity of S.G. Mikhlin with a list of his publications

(1932-1957) containing 78 papers. There is a photo of Mikhlin.

Card 1/1



16(1) AUTHOR:

Ladyzhenskaya, 0.1.

SOV/43-58-19-2/16

TITLE:

On Instationary Navier-Stokes Equations (O nestatsionarnykh

uravneniyakh Nav'ye-Stoksa)

PERIODICAL:

Vestnik Leningradskogo universiteta, Seriya matematiki, mekhaniki i astronomii, 1958, Nr 19(4), pp 9 - 18 (USSR)

ABSTRACT:

The author considers the problem

$$\vec{L}\vec{u} = \frac{\partial \vec{u}}{\partial t} + \mathcal{E} \Delta^2 \vec{u} - \nu \Delta \vec{u} + u_k \frac{\partial \vec{u}}{\partial x_k} + \text{grad } p = \vec{f}$$

$$\operatorname{div} \vec{u} = 0$$
, $\vec{u}|_{\mathbf{B}} = \Delta \vec{u}|_{\mathbf{B}} = 0$, $\vec{u}|_{\mathbf{t}=0} = \vec{u}^{0}(\mathbf{x})$

where $\vec{u} = (u_1, u_2, u_3)$, $\epsilon > 0$, $\nu > 0$, S is the sufficiently

smooth boundary of the bounded domain Ω , $\overrightarrow{f} \in L_2(Q_m)$,

$$\vec{\mathbf{d}}^{\circ} \in \mathbb{W}_{2}^{2}(\Omega)$$
, $Q_{\underline{\mathbf{T}}} = \Omega \times [0, \underline{\mathbf{T}}]$, $\operatorname{civ} \vec{\mathbf{d}}^{\circ} = 0$.

The author shows that under these conditions the problem possesses a unique solution \vec{u} , p in Q_T . Several estimations

Card 1/2

On Instationary Navier-Stokes Equations

SOV/43-58-19-2/16

hold for the solution, e.g.

$$\int_{0}^{\infty} \vec{u}^{2}(x,t) dx + \int_{0}^{t} \int_{0}^{\infty} \left[\mathcal{E}(\Delta \vec{u})^{2} + \mathcal{V} \sum_{i} \vec{u}_{x_{i}}^{2} \right] dx \ dt \leqslant c_{1},$$
where c_{1} only depends on $\int_{0}^{\infty} \vec{u}^{2}(x,0) dx$ and $\int_{0}^{\infty} \int_{0}^{2} dx \ dt$.

Under certain conditions the solution tends for $\ell \to 0$ to the unique boundary value which is the generalized solution of the boundary value problem for the Navier-Stokes equations.

In a second theorem the author proves the existence of a unique solution of the analogue of the Navier-Stokes boundary value problem proposed by Leray [Ref 1].

A third theorem is merely stated and says that the mentioned analogous problem is uniquely solvable "in the large" (in the sense of [Ref 5]).

There are 8 references, 3 of which are Soviet, 1 German, 3 French, and 1 Swedish.

SUBMITTED:

July 4, 1958

Card 2/2

AUTHOR:

Ladyzhenskaya, O.A. (Leningrad)

39-45-2-2/7

TITLE:

On Instationary Operator Equations and Their Application to Linear Problems of Mathematical Physics (O nestatsionarnykh operatornykh uravneniyakh i ikh prilozheniyakh k lineynym zadacham matematicheskoy fiziki)

PERIODICAL: Matematicheskiy sbornik, 1958, Vol 45, Nr 2, pp 123-158 (USSR)

ABSTRACT

In her earlier papers [Ref 1-3] the author developed a new method for the proof of the solvability of instationary boundary value problems and she proved the solvability of the Cauchy problem for the operator equations

(1)
$$\frac{du}{dt} + S(t)u = f(t)$$

(1)
$$\frac{du}{dt}$$
 + S(t)u = f(t) and (2) $\frac{d^2u}{dt^2}$ + S(t)u = f(t),

where S(t) are linear generally not bounded operators in the Hilbert space H. In the first chapter of the present paper it is shown that from the solvability of the Cauchy problem for (1) and (2) there follows the solvability of the Cauchy problem and the boundary problems for equations of parabolic, hyperbolic and of the Schrödinger type as well as for strongly parabolic and hyperbolic systems, respectively. In the second chapter the equation

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On Instationary Operator Equations and Their Application to 39-45-2-2/7

(3) Au =
$$S_{1}(t) \frac{d^{2}u}{dt^{2}} + S_{2}(t) \frac{du}{dt} + S_{3}(t)u = f$$

is considered with the aid of the difference method of the author [Ref 3]. It is investigated which difference schemes converge for (3). In the third chapter the method of the continuation with respect to the parameter (compare author [Ref 5]) is somewhat simplified. Altogether the paper contains 12 partially announced theorems.

There are 19 references, 17 of which are Soviet, 1 Swedish and 1 American.

SUBMITTED: December 12, 1956

1. Operators (Mathematics) 2. Topology-Applications 3. Hyperbolic equations-Theory

Card 2/2

AUTHOR: Ladyzhenskaya, O.A 20-120-5-7/67 On the Differential Properties of Generalized Solutions of Some TITLE: Multidimensional Variation Problems (O differentsial'nykh svoystvakh obobshchennykh resheniy nekotorykh mnogomernykh variatsionnykh zadach) PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 120, Nr 5, pp 956-959 (USSR) Given the functional $I(u) = \int_{\Omega} F(u_1, \dots, u_n) dx$, where $dx = dx_1 \cdot dx_n$, ABSTRACT: $u_i = \frac{\partial u}{\partial x_i}$, Ω a bounded domain of the n-dimensional space and F a two times continuously differentiable function satisfying certain additional conditions. The function u(x) is sought for which I(u) has a minimum; this u(x) is denoted as the generalized solution. The unique solvability of this variation problem has already been proved by Morrey [Ref 2]. The author shows that under certain assumptions on the function class to which there belongs u, u has generalized second derivatives $\mathbf{u}_{\mathbf{i}\,\,\mathbf{i}}$ in Ω and almost everywhere it satisfies the equation $F_{ij}u_{ij} = 0$. Further it is shown that the integral Card 1/2

On the Differential Properties of Generalized Solutions of Some 20-120-5-7, 67 Multidimensional Variation Problems

 $\int_{\Omega_{+}} (|u|_{1}^{p-2} + 1) \sum_{i,j} u_{i,j}^{2} dx \leq \text{const if } \Omega_{+} \text{ lies entirely in } \Omega_{+} p \geq 2$

and $|u(x)|_1 = \sqrt{\sum_{k=1}^{n} \frac{u^2}{u_k^2}(x)}$. Under further assumptions u(x) is

continuous and satisfies the Lipschitz condition. Corresponding reversion theorems are valid too.

There are 8 references, 4 of which are Soviet, 1 Italian, 2 American and 1 German.

ASSOCIATION: Leningradskoye otdeleniye matematicheskogo instituta imeni V.A. Steklova Akademii nauk SSSR (Leningrad Section of the Mathematical Institute imeni V.A. Steklov of the Academy of Sciences of the USSR)

PRESENTED: February 10, 1958, by V.I.Smirnov, Academician SUBMITTED: January 30, 1958

1. Methematics

Card 2/2

AUTHOR: Ladyzhenskaya, O.A. and Faddeyev, L.D. sov/20-120-6-5/59

TILE: On the Perturbation Theory of the Continuous Spectrum (K teorii

vozmushcheniy nepreryvnogo spektra)

PERIODICAL: Doklady Akademii nauk SSSR, Vol 120, Nr 6, pp 1187-1190 (USSR), 1958 Let K be an integral operator and let L_0 denote the multi-ABSTRACT:

plication with the independent variable. The investigation of the spectrum of L = L_o + ϵ K led Friedrichs [Ref 1,2] to the consideration of the integral equation

(1) $r(\lambda,\mu)=k(\lambda,\mu)+i\tilde{\chi} \in k(\lambda,\mu)r(\mu,\mu)+\epsilon P\left(\frac{k(\lambda,6)r(6,\mu)}{\mu-6}\right)$

The solubility of (1) was proved by Friedrichs for small ε only. The authors prove that (1) is solvable for an arbitrary finite ℓ , and they present some properties of the spectrum of L without restriction to small ϵ .

There are 2 non-Soviet references, 1 of which is German, and

Card 1/2

On the Perturbation Theory of the Continuous Spectrum SOV/20-120-6-5/59

ASSOCIATION: Leningradskoye otdeleniye matematicheskogo instituta imeni V.A. Steklova (Leningrad Section of the Mathematical Institut imeni V.A. Steklov of the Academy of Sciences of the USSR)

PRESENTED: February 17, 1958, by V.I. Smirnov, Academician

SUBMITTED: February 10, 1958

1. Perturbation theory 2. Spectroscopy

Card 2/2

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10(6) AUTHOR: Lady henskaya, O. A. SOV/20-123-3-12/54 The Solution "In the Whole" of the Boundary Problem for the TITLE: Equations of Navier-Stokes in the Case of Two Spatial Variables (Resheniye "v tselom" krayevoy zadachi dlya uravneniy Nav'ye -Stoksa v sluchaye dvukh prostranstvennykh peremennykh) Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 3, pp 427-429 PERIODICAL: (USSR) The author investigated (within the region Ω of the variation ABSTRACT: of $x = (x_1, x_2)$) the system of Navier (Nav'ye)-Stokes (Stokes) equations $\vec{v}_t - \sqrt{\Delta \vec{v}} + \sum_{k=1}^{2} \vec{v}_k \vec{v}_{x_k} = -\text{grad } p + \vec{f}(x,t), \ \text{div} \vec{v} = 0$ for the functions $\vec{v} = (v_1(x,t), v_2(x,t))$ and p(x,t) under the boundary and initial conditions $\vec{v}|_{S} = 0$, $\vec{v}|_{t=0} = \vec{a}(x)$ (div $\vec{a} = 0$). In this paper, the following theorem is proved: The theorem characterized by the above equations can be solved "In the whole" Card 1/2

The Solution "In the Whole" of the Boundary Problem SOV/20-123-3-12/54 for the Equations of Navier-Stokes in the Case of Two Spatial Variables

(i.e. for any $t \ge 0$ for any values of the Reynolds (Reynolds) number in the initial instant of time and for any T) if the

integrals $\int_{\Omega} \vec{a}^2 dx$, $\int_{\Omega} [\vec{v}_t(x,0)]^2 dx$, $\int_{0}^{t} \int_{\Omega} [r^2 + (\vec{r}_t)^2] dx dt$

are finite. The problem of the existence "In the whole" may be reduced to the finding of an apriori estimate of the integral

 $\int\limits_0^t \int\limits_\Omega (\overrightarrow{v}_t)^2 dx \ dt + \int\limits_\Omega \sum\limits_{k=1}^2 v_k^4(x, \overrightarrow{t}) dx \ \text{or of max} \ |\overrightarrow{v}| \ . \ \text{The proof}$

of this theorem is given step by step. The author thanks
A. O. Gel'fond for proving an inequation. There are 3 references,
1 of which is Soviet.

ASSOCIATION:

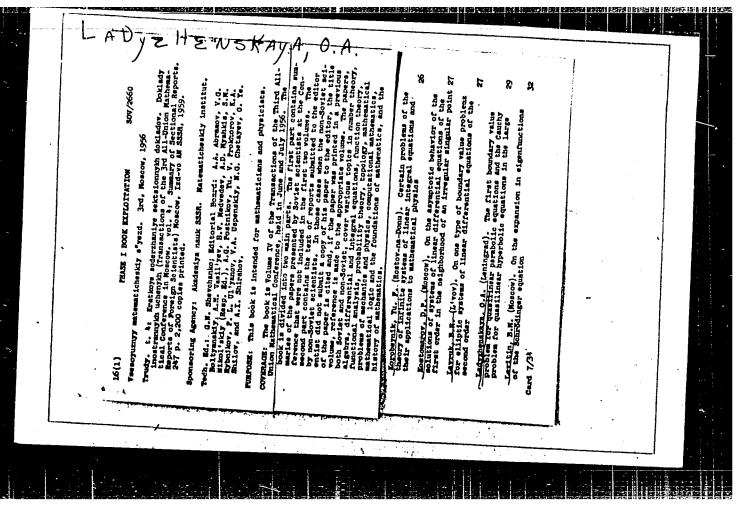
Leningradskoye otdeleniye Matematicheskogo instituta im. V. A. Steklova Akademii nauk SSSR (Leningrad Branch of the Mathematical Institute imeni V. A. Steklov of the Academy of Sciences, USSR)

PRESENTED:

September 29, 1958, by V. I. Smirnov, Academician September 25. 1958

SUBMITTED:

Card 2/2



APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928420005-1"

LADYZHENSKAYA, O.A.
PHASE I BOOK EXPLOITATION BOY/2960

Moskevskoye matematicheskoye obshchestvo

Trudy, t. 8 (Transactions of the Moscow Mathematical Society, Vol 8) Moscow, Fizmatgiz, 1959. 518 p. Errata slip inserted. 2,050 copies printed.

Ed.: A.F. Lapko; Tech. Ed.: S.S. Gavrilov; Editorial Board: P.S. Aleksandrov, I.M. Gel'fand, and O.N. Golovin.

PURPOSE: This book is intended for mathematicians and theoretical physicists.

COVERAGE: This book contains a collection of articles by leading Soviet mathematicians on problems in pure and applied mathematics. All articles were written in 1957 and 1958. Among the topics discussed are: analytic - operator functions, function spaces, nonstationary plane flow of a viscous non-compressible liquid, root spaces, products of groups representations, ordinary and partial differential equations, 3rd and 4th order linear equations, homogeneous spaces, spectral theory of operators, and generalized random processes. References accompany each article.

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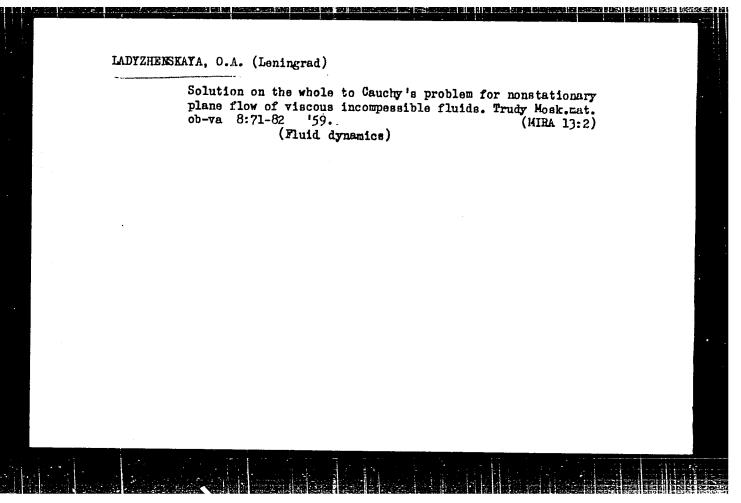
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	AC/gmp 1-12-60

SMIRNOV, Vladimir Ivanovich, akademik. Prinimali uchastiye: LADYZHENSKAYA, 0.A., prof.; BIRMAN, M.S.; AKILOV, G.P., red.; POL'SKAYA, R.G., tekhn.red.

[Course in higher mathematics] Kurs vysshei matematiki. Moskva, Gos.izd-vo fiziko-matem.lit-ry. Vol.5. 1959. 655 p.

(MIRA 12:10)

(Mathematics)



16(1) AUTHOR:

Ladyzherskaya, 0.A.

SOV/42-14-3-3/22

TITLE:

Investigation of the Navier-Stokes Equations in the Case of

Stationary Motion of an Incompressible Fluid

PERIODICAL:

Uspekhi matematicheskikh nauk, 1959, Vol 14, Nr 3, pp 75-98(USSR)

ABSTRACT:

In the domain Ω with boundary S the author investigates the solvability of the Navier-Stokes equations for a stationary motion of a viscous incompressible fluid. On the basis of the results of Odqvist and Leray the author shows that the posed problem possesses a solution in the large for a finite as well as for an infinite domain Ω . The consideration is carried

out in two functional spaces, in \mathbb{W}_2^1 (Ω) and in $\mathbb{C}^1(\Omega)$. The consideration in \mathbb{W}_2^1 (Ω) has the advantage that the existence of the generalized solution follows from very general properties of the corresponding operators and that with respect to S and the forces of inertia f only minimum assumptions are necessary. In \mathbb{C}^1 (Ω) the author proves the existence of the classical solution under assumption of

Card 1/2

- Investigation of the Navier - Stokes Equations SOV/42-14-3-3/22 in the Case of Stationary Motion of an Incompressible Fluid

certain conditions of smoothness for S and f . For the exterior problem the author puts $\,u_{00}^{}$ - const on account of

simplicity. She shows that the internal and external stationary problem of hydromechanics possesses at least one solution for all values of the Reynolds number. Contents: Chapter I. Generalized solutions. Chapter II. Classical solutions.

The author mentions S.G. Kreyn, I.I. Vorovich, V.I. Yudovich, S.L. Sobolev.

There are 9 references, 3 of which are Soviet, 3 German, 2 French, and 1 American.

SUBMITTED: April 1, 1958

Card 2/2

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ALEKSANDROV, A.D.; AKILOV, G.P.; ASHREVITS, I.Ya.; VALIAHER, S.V.;

VIADIMIROV, D.A.; VULIKH, B.Z.; GABURIN, M.K.; KANFOROVICH, L.V.;

KOLBINA, L.I.; LOZINSKIY, S.M.; LADYZHENSKAYA, O.A.; LINNIK, Yu.V.;

LERBERY, N.A.; MIKHILN, S.G.; MAKAROV, B.M.; MATAHSON, I.P.;

MIKITIN, A.A.; POLYAHOV, N.N.; PINSKER, A.G., SHIROV, V.I.;

SAFROMOVA, G.P.; SMOLITSKIY, Kh.L.; FADIEYEV, D.K.

Grigorii Mikhailovich Fikhtengol'ts; obituary. Vest. IGU 14 no.19:

158-159 '59. (MIRA 12:9)

(Fikhtengol'ts, Grigorii Mikhailovich, 1888-1959)
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10(2) AUTHORS: Ladyzhenskaya, O.A. and Solonnikov, V.A.

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SOV/20-124-1-5/69

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TITLE:

On the Solvability of Man-stationary Problems of Magnetic Hydrodynamics (O razreshimosti nestatsionarnykh zadach magnitnoy gidrodinamiki)

PERIODICAL:

Doklady Akademii nauk SSSR,1959, Vol 124, Nr 1,pp 26-28 (USSR)

ABSTRACT:

The authors consider a viscous incompressible liquid in a magnetic field. For the determination of the velocity, pressure, electric and magnetic potential they use the original enlarged Maxwell system of equations with the initial conditions $v(0) = v_0$, $H(0) = H_0$ and with different

boundary conditions. Three boundary value problems are formulated and their solvability in the large is proved under relatively weak conditions. The final results are about the same as for the Navier-Stokes equations in [Ref 1] . The authors propose a scheme for the solution of the problems. There is 1 Soviet reference.

ASSOCIATION:

Leningradskoye otdeleniye matematicheskogo instituta imeni V.A. Steklova AN SSSR (Leningrad Section of the Mathematical Institute imeni V.A. Steklov AS USSR)

Card 1/2

On the Solvability of Mon-stationary Problems of SOV/20-124-1-5/6
Magnetic Hydrodynamics

PRESENTED: August 11, 1958, by V.I. Smirnov, Academician
SUBMITTED: August 8, 1958

Card 2/2

10(4) AUTHOR:

Ladyzhenskaya, 0. A.

SOV/20-124-3-15/67

TITLE:

The Steady Motion of a Viscous Incompressible Fluid in a Pipe (Statsionarnoye dvizheniye vyazkoy neszhimayemoy zhidkosti v

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 3, pp 551-553

ABSTRACT:

In two earlier papers (Refs 1,2) the problem of a steady flow round bodies of finite dimensions with given $\tilde{u}_{\infty} = const$ in infinity is investigated. Here the existence of at least one laminary motion in the case of arbitrary Reynolds numbers was proved. In the present paper it is proved that the same applies to an infinite tube of arbitrary diameter. I. Leray (Ref 1) during his Lemingrad stay attracted the author's attention to this problem. R is assumed to be an unlimited range of the Euclidian space $x = x(x_1,x_2,x_3)$ consisting of the three parts Ω_1 , Ω_2 , and Ω_3 . The parts Ω_1 and Ω_3 are parts of cylindrical tubes of arbitrary diameters \mathbf{D}_1 and \mathbf{D}_3 , which

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extend into infinity. Ω_2 is the middle part of the tube Ω_* ,

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which connects Ω_1 and Ω_3 with each other. $\overline{a}_1(x)$ and $\overline{a}_3(x)$ are assumed to be the steady motions corresponding to cylindrical tubes which are unlimited on both sides and have the cross sections D_1 and D_3 (which do not vary along the axes of these tubes). To these solutions $\overline{a}_1(x)$ and $\overline{a}_3(x)$ of the nonlinear steady problem of the hydrodynamics of viscous fluids there correspond the pressures $p_1(x)$ and $p_3(x)$, which have constant gradients directioned along the axes of the tubes. The problem to be solved by the present paper consists in finding (within Ω) the solution $\overline{u}(x)$, p(x) of the system of equations of Navier-Stokes $-y\Delta \overline{u} + u_k \overline{u}_{xk} = \operatorname{grad} p + f$, div $\overline{u} = 0$, which on the boundary S of the tube Ω , must obey the condition $\overline{u}(x) = 0$, and for which, besides $\overline{u} - \overline{a}_1$, $|x| - \infty$, $x \in \Omega_1$, $\overline{u} - \overline{u}_3$, $|x| - \infty$, $x \in \Omega_3$ holds. Next, the Hilbert space $H(\Omega)$ is defined. The following theorem holds: The problem consisting

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of the aforementioned equations and secondary conditions has at least one generalized solution \overline{u} for an arbitrary \overline{f} , which determines the linear functional $\int_{\Omega}^{\infty} \overline{f} \, \overline{\phi} dx$ with respect to $\overline{\phi}$ in $H(\Omega)$. This function will be all the smoother, the smoother \overline{f} and the boundary S will be. If especially \overline{f} and the derivatives up to the second order of the boundary functions satisfy Gelder's condition, the generalized solution will be a classical one. Next, the proof of this theorem is outlined. This proof can also be generalized. There are 2 references, 1 of which is Soviet.

ASSOCIATION:

Leningradskoye otdeleniye Matematicheskogo instituta im. V. A. Steklova Akademii nauk SSSR (Leningrad Department of the Mathematics Institute imeni V. A. Steklov of the Academy of Sciences, USSR)

PRESENTED:

September 15, 1958, by V. I. Smirnov, Academician

SUBMITTED:

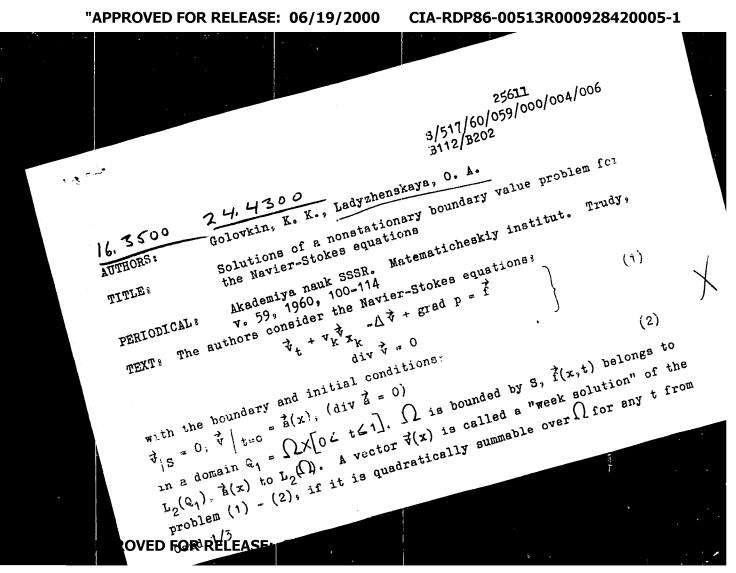
September 11, 1958

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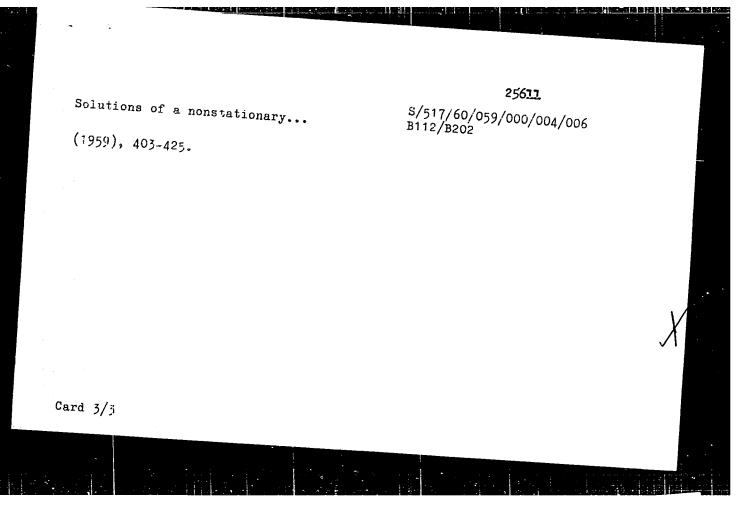
LADYZHENSKAYA, O. A. (Leningrad)

"On the Solvability of Various Problems of Hydrodynamics and Megnetohydrodynamics for a viscous incompressible Fluid."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27Jan - 3 Feb 1960



25611 s/517/60/059/000/004/006 B112/B202 Solutions of a nonstationary ... $[0,\overline{\mathbb{Q}}]$ if $\overline{\mathfrak{F}}_{x_{\mathbf{k}}}$ is from $\mathbf{L}_{2}(\mathbb{Q}_{1})$, and if the condition: $\int \left[\overrightarrow{x} \overrightarrow{\phi}_{t} \cdot \overrightarrow{x}_{x} \overrightarrow{\phi}_{x} \right] dxdt = \int \overrightarrow{a} \overrightarrow{\phi} \left[\overrightarrow{\phi}_{t} \overrightarrow{\phi}_{x} \overrightarrow{x}_{x} + \overrightarrow{f} \right] dxdt$ (3) The fulfilled for any smooth solenoidal vector $\phi(x,t)$ vanishing for $t \in \mathbb{N}$, the present paper is based on the following principal theorem: if i(x,t) is the present paper is based on the following principal theorem: \vec{v}_y p of the problem from $L_2(\mathbb{Q}_1)$ and $\vec{c}(x)$ from $L_2(\Omega)$ every weak solution: \vec{v}_y p of the problem (1)=(2) has derivatives: v_t , v_{ix_j} , v_{ix_j} , which are from $L_{\epsilon/4}(v_i)$. This theorem is proved by a theory of nonstationary hydrodynamic potentials which had been developed by K. K. Golovkin (Akademiya nauk SSSR. Matematicheskiy institut. Trudy, v. 59. 1960, 87 - 99), S. G. Mikhlin is mentioned. There are 10 references: 6 Soviet-bloc and 3 non-Sovietbloc. The most important reference to English termage publications reads as follows: O. A. Ladyzhenskaya, Solution the Large of the Nonstationary Boundary Value Problem Let when Stokes System with Two Card 2/3



8/124/61/000/012/007/038 D237/D304

AUTHORS:

Ladyzhenskaya, O. A., and Solonnikov, V. A.

TITLE:

الله على ما الله الله

Solving some non-stationary magnetohydrodynamic problems for a viscous non-compressible fluid

PERIODICAL:

Referativnyy zhurnal, Mekhanika, no. 12, 1961, 7, abstract 12B40 (Tr. Matem. in-ta. AN SSSR,

1960, 59, 115-173)

The results obtained earlier by the authors are presented in detail (Dokl. AN SSSR, 1959, 124, no. 1, 26-28-RZhMekh, 1960, no. 8, 9907). Boundary problems of three types are formulated, corresponding to different distributions of the regions filled with dielectric, solid conductor and fluid. The classical presentation is replaced by a generalized one, i.e., equations of continuity and boundary conditions are replaced by the necessity for the sought functions to belong to some Hilbert spaces; while the remaining equations are replaced by integral identities,

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S/020/60/135/006/005/037 C 111/ C 333

AUTHORS: Ladyzhenskaya, O. A., Ural'tseva, N. N.

TITLE: On the Variation Problem and Quasilinear Elliptic Equations With Multiple Independent Variables

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 6, pp. 1330-1333

TEXT: On the results of this paper it was partially reported:
1.) In autumn 1959 in the seminary of V. J. Smirnov in Lemingrad,
2.) in autumn 1959 in the surveying lecture at the Lemingrad
Mathematical Society, 3.) in December 1959 in the seminary of J. G.
Petrovskiy in Moscow.

Let: E_k a k-dimensional Euclidean space, Ω a bounded domain with the boundary S; Ω' a rigorously internal subdomain of Ω ; $C_1 \propto (\Omega)$, $W'(\Omega)$ be defined as in (Ref.1,2); $O_1(\Omega)$ the class of the functions $u(\overline{x})$, $x \in \Omega$ for which the derivatives of (1-1)rst order possess a first differential, where the derivatives up to the 1-th order are bounded on each compact part of Ω ; $\mathcal{M}(|u|)$ a positive monotonely increasing (function of |u|), \vee (|u|) a positive monotonely decreasing function of |u|; μ a number μ 1.

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Let (L) satisfy the condition (A), if there are constants a > 0 and (T,1), such that for every sphere K(g) with radius $g \leq a$ and center on S it holds: mes $[K(g) \cap \Omega_i] \leq (1-\theta)$ mes K(g).

§ 1. Let the condition (B) say that 1.) every differentiation of the functions $a_{ij}(x,u,p_k)$, $a(x,u,p_k)$ to p_k reduces its orders of growth in p at least by 1, while the differentiation to x_k and u does not enlarge these orders and 2) the inequalities 2.) the inequalities

2.) the inequalities
$$(5) \forall (|u|)(p^2 + 1)^{m/2} \leq a_{ij}(x, u, p_k) p_i p_j \leq (|u|)(p^2 + 1)^{m/2}$$

(6)
$$|a(x,u,p_k)| \le \omega(|u|)(p^2 + 1)^{m/2}, p = \left(\sum_{k=1}^n p_k^2\right)^{1/2}$$

hold.

Theorem 1: Let u(x) be the solution of the equation

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(3) $L_1(u) \equiv a_{ij}(x,u,u_{x_k}) u_{x_i x_i} + a(x,u,u_{x_k}) = 0$

assume that it belongs to the class $O_3(\Omega) \cap C_1(\overline{\Omega})$ and satisfies

(2) $u = \varphi(s)$

For $a_{i,j}(x,u,p_k)$, $a(x u p_k) \in O_1(\Lambda x E_1 x E_n)$ let (B) and

(7) $\forall (|u|)(p^2 + 1)^{m/2-1} \leq a_{ij}(x,u,p_k) \xi_i \xi_j \leq (|u|)(p^2+1)^{m/2-1}$ be satisfied for $\sum_{i=1}^{\infty} \xi_i^2 = 1$. Then the author estimates $\max_{x_i} |u_{x_i}|$ by max | u| and $|C|_{C_{2,0}}(s)$, if the oscillation of u(x) is small in Ω and S belongs to $C_{2,0}$.

Theorem 2: If the conditions of theorem 1 are satisfied except those for S and φ , then max $|u_{x_i}|$ is estimated by max |u| for every $\Omega_i \subset \Omega_i$.

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APPROVED FOR RELEASE: 06/19/2000

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Theorem 3: Modification of theorem 1 under renunciation of the small oscillation of u(x).

Theorem 4 and 5 give similar statements on the estimations of the norms of solutions for the equation

(4)
$$M_1(u) \equiv \frac{\partial}{\partial x_1} (a_1(x,u,u_{x_k})) + a(x,u,u_{x_k}) = 0$$

where in theorem 4 the author assumes that

(9)
$$a_i(x,u,p_k) p_i \ge \vee (|u|) p^m, p \gg 1$$
.

§ 2. Theorem 6 is the statement of existence for the problem

(10)
$$M_{\tau}(u) \equiv \tau M_{1}[u] + (1-\tau) M_{0}(u) = 0$$
, $u \mid_{S} = \tau \varphi(s)$,

where

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$$M_{o}(u) = \frac{\partial}{\partial x_{i}} F_{u_{x_{i}}}^{o} - F_{u}^{o}, F^{o}(x, u, u_{x_{k}}) = \left(\sum_{i} u_{x_{i}}^{2} + 1\right)^{m/2} + \mu^{2}.$$

Theorem 7: For (3) let (B) and (7) be satisfied for n=2, where m=2 is assumed without restriction of generality. Let

$$|a(x,u,p_k)| \leq \omega(|u|)(p^2+1)^{1-\epsilon}$$
, $\epsilon > 0$ be instead of (6).

Then the problem $L_{\tau}(u) \equiv \nabla L_{1}(u) + (1-\tau)(\Delta u - u) = 0$, $u \mid_{S} = \tau \varphi(s)$ possesses at least one solution $u(x,\tau)$ from $C_{2,\alpha}(\Omega) \wedge C_{3,\alpha}(\Omega)$ for all $\tau \in [0,1]$, if the values $u(x,\tau)$ are uniformly bounded for all such possible solutions $u(x,\tau)$. The functions a_{ij} , a must be belong to $C_{1,\alpha}$, $\varphi \in C_{2,\alpha}$, $S \in C_{2,\alpha}$, Ω homeomorphic to the circle.

§ 3. The variation problem

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(1) inf $I(u) = \inf \int_{\Omega} F(x,u,u_{X_K}) dx$, $x = x_1, \dots, x_n$ is considered under the condition (2). Assume that $F(x,u,p_k)$ has the order of growth m > 1 in p and that every differentiation of F to p_k reduce this order at least by 1, while the order does not increase by differentiation with respect to x_n and u. Let

X

F(x,u,pk) > 1(|u|) pm

(11) $F_{\rho_{i} \rho_{j}}(x,u,p_{k}) \xi_{i} \xi_{j} \geq \gamma_{2}(|u|)(p^{2}+1)^{\frac{m-2}{2}} \sum \xi_{i}^{2}$ $F_{\rho_{i}}(x,u,p_{k}) p_{i} \geq \gamma_{3}(|u|) p^{m}, p \gg 1.$

Theorem 8: Let u be a generalized solution from W_m^1 (Ω_n) of the "conditional" variation problem (1) - (2), i. e. of the problem completed by the condition that all comparison functions do not exceed a certain constant: $M \ge \max_n |u|$. The solution u belongs Card 6/8

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to $C_{0,\alpha}$ (Ω), if $F \in C_1$ and if the conditions

$$(12) \begin{array}{c} (u|)p^{m} \geq F_{\mathbf{p}_{i}}(x,u,p_{k}) p_{i} \geq \vee (|u|) p^{m}, p \gg 1 \\ |F_{u}(x,u,p_{k})| \leq \omega(|u|) p^{m} \end{array}$$

are satisfied. Under the same assumptions for F every bounded function $u \in W_{m}^{\prime}(\Omega)$, for which $\delta I(u) = 0$, belongs to $C_{0,\alpha}(\Omega)$. If Ω satisfies the condition (A) and if $\Phi \in C_{1}$, then $u \in C_{0,\alpha}(\overline{\Omega})$. Theorem 9. Under the conditions for F formulated at the beginning of \S 3 every bounded generalized solution u(x) of the variation problem (1) - (2) from the class $W_{m}^{\prime}(\Omega)$ belongs to $C_{k,\alpha}(\Omega)$, if $F \in C_{k,\alpha}$, $k \geq 3$ and $\Delta I(u) = I(u+m) - I(u) > 0$ for every sufficiently small local variation M(x). If, however, $S \in C_{1,\alpha}$, $M \in C_$

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Finally the author gives two lemmata generalizing the lemma due to E. de Giorgi (Ref.4).

S. N. Bernshteyn is mentioned by the author.

There are 4 references: 2 Soviet, 1 Italian and 1 American.

[Abstracter's note: (Ref.1) is the book of C. Miranda: Partial Differential Equations of Elliptic Type] .

ASSOCIATION: Leningradskiy gosudarstvennyy universitet imeni A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

PRESENTED: June 10, 1960, by V. J. Smirnov, Academician SUBMITTED: June 2, 1960

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LADYZHENSKAYA, Ol'ga Aleksandrovna; VOLOKHONSKIY, L.Sh., red.;
LUK'YANOV, A.A., tekhn. red.

[Mathematical aspects of the dynamics of a viscous incompressible fluid] Matematichėskie voprosy dinamiki viazkoi neszhimaemoi zhidkosti. Moskva, Izd-vo fiziko-matem. lit-ry, 1961. 203 p. (MIRA 15:2)

(Hydrodynamics)

16.3500

S/042/61/016/001/001/007 C 111/ C 333

AUTHORS:

Ladyzhenskaya, O. A., Ural'tseva, N. N.

TITLE:

Quasilinear elliptic equations and variational problems with several independent variables

PERIODICAL:

Uspekhi matematicheskikh nauk, v. 16, no. 1, 1961,

TEXT: The paper is a general lecture which was given on November 24, 1959 on the occasion of the 80th birthday of S. N. Bernshteyn at the Leningrad Mathematical Society. The new results were represented in the seminaries of V. J. Smirnov (Leningrad) and J. G. Petrovskiy (Moscow) at the end of 1959.

Two problems are considered: 1.) the first boundary value problem for quasilinear elliptic equations

$$\sum_{i,j=1}^{n} a_{ij}(x,u,u_{x_k}) u_{x_ix_j} + a(x,u,u_{x_k}) = 0$$
 (1)

and 2.) the differential properties of the generalized solutions